

## **SPRAY BOTTLE**

### **Cross Reference to Related Application**

This application is related to my previously filed US Provisional Application 60/433,288 filed 16 December 2002.

### **Field Of Invention**

This invention relates to manually operated pump type dispenser containers having a trigger-type spray head with a flexible suction tube depending therefrom, and more particularly to an improved two chamber container in which the free end of the suction tube is contained in a small chamber such that the dispenser can be used in any orientation, including inverted. In a preferred embodiment a guide wall may be provided to facilitate insertion of the free end of the suction tube into the small chamber by automated equipment.

### **Description of Prior Art**

Numerous manually operated pump type dispenser containers, or spray bottles have been described in the prior art and numerous types are in everyday use around the world to dispense such products as window cleaning fluids, shampoos, car wash detergents, and other similar cleaning fluids and polishes. Such bottles are generally manufactured by blow molding techniques, and for ease of manufacture are generally single chamber bottles. This means, however, that once the liquid level has fallen somewhat in the bottle, the bottle cannot be used in anything but the vertical position. Double chamber bottles have been suggested, and attention is directed to, for example, US Patent 5,518,150, which provides a longitudinally extending interior guide wall to facilitate location of the suction tube in the smaller

chamber so that the dispenser can be used in a non-upright position. However, when the liquid level in the bottle falls and the bottle is turned beyond the horizontal position, the free end of the suction tube is exposed and not all of the liquid in the bottle can be removed. Others have tried to overcome this problem by adjusting the position of, and reconstructing, the suction tube, with varying degrees of success. There is, therefore, a need for an improved bottle that can be used in almost any orientation including substantially inverted.

#### Object of Invention

It is an object of the present invention to provide an improved spray bottle incorporating a transverse shelf extending partially across the bottle so as to provide a second chamber into which the free end of a flexible suction tube can be directed and from which substantially all of the contents of the bottle can be removed, whatever the orientation of the bottle. In a preferred embodiment a longitudinal guide wall is also provided so as to facilitate introduction of the free end of the flexible suction tube by automatic machinery.

#### Brief Description of Invention

By one aspect of this invention there is provided a liquid spray dispenser, comprising:

- (a) spray dispensing means for dispensing a liquid;
- (b) liquid container means for holding a liquid, said container means having a vertical and a horizontal axis and a neck portion adapted adapted to releasably receive and retain said spray dispensing means;
- (c) a flexible suction tube depending from the spray dispenser means and in liquid communication therewith;

- (d) a pair of partition means, for dividing said container means into liquid-communicating first and second chambers, arranged so as to direct a free end of said suction tube from said spray dispensing means into said first chamber; and
- (e) wherein at least one of said pair of partition means extends from a side wall of said container means so as to form an internal wall of said first chamber and retain liquid therein when said container means is moved from a vertical position to a horizontal position.

#### Brief Description of Drawings

Fig. 1 is a side view of a spray bottle of the prior art;

Fig. 2 is a side view of a spray bottle according to one embodiment of the present invention, in the vertical position;

Fig. 3 is a side view of the spray bottle of Fig. 1, in the horizontal position;

Fig. 4 is a side view of a spray bottle according to an alternative embodiment of the present invention, in the vertical position;

Fig. 5 is a side view of the embodiment of Fig. 3, in the horizontal position;

Fig. 6 is a side view of a spray bottle according to another embodiment of the present invention, in the vertical position ;

Fig. 7 is a side view of the embodiment of Fig. 6, in the horizontal position;

Fig. 8 is a side view of the embodiment of Fig. 6, in an inverted position;

Fig. 9 is a side view of a bottle according to yet another embodiment, in vertical position; and

Fig. 10 is a side view of a modified version of the embodiment of Fig. 9, in vertical position.

### Detailed description of preferred Embodiments

In Fig 1 there is shown a spray bottle 1, of the prior art, having a trigger type spray 2 and cap 3 screwed thereon. A flexible suction tube 6 depends from the spray 2 and a longitudinal wall 4 is also provided, extending from the base 5 and curving upwardly to a point adjacent the cap 3, to facilitate location of a free end of the suction tube 6 in the small container 7. It will be appreciated that containers of this type are generally produced by blow molding and therefore wall 4 is hollow.

In Figs. 2 and 3 there is shown one embodiment of the present invention, which is similar to Fig 1 in that the bottle 7 is provided with a manual trigger type spray 8, a cap 9 and a longitudinal wall 10 arranged to direct the free end of a suction tube 11, depending from the spray 8 and in liquid communication therewith, into a small reservoir 12. In addition, however, there is provided a transverse wall 13 which extends from the wall of the bottle 7 to a point adjacent but spaced from wall 10 and substantially parallel to the base of the bottle, so that when the bottle 7 is tipped to a horizontal position liquid is trapped in reservoir 12 and the spray remains functional. This remains true even when the bottle is tipped beyond the horizontal. In a preferred embodiment, as shown in Figs. 4 and 5, the wall 14 does not extend perpendicularly from the side of the bottle, but slopes downwardly (when the bottle is in the upright or vertical position) towards the base of the bottle. This ensures that liquid remains in the reservoir 12 even when the bottle is inverted completely. In Figs 6,7 and 8 there is shown a further embodiment wherein wall 15 extends perpendicularly from the wall of bottle 7, but turns approximately through a right angle so as to provide a reservoir 12 that contains liquid even when the bottle is inverted as seen in Fig. 8. In Fig. 9, there is shown a further alternative

embodiment in which two partitions 14 are placed substantially symmetrically on each side of the bottle to provide a more symmetrical and aesthetically pleasing bottle. The free end of suction tube 11 can thus be directed into either of the reservoirs 12 by rotating the cap 9 as desired. In Fig. 10, there is shown a slightly modified version of the embodiment of Fig. 9 wherein the two partitions 14, of unequal length, extend from the side walls of an asymmetrically shaped bottle, so as to direct the free end of the suction tube 11 towards the "heavy side" 16 of the bottle 17. If desired, the trigger 8 can be swivelled so as to ensure that the reservoir is always strategically placed for an upward or downward application.

It will be appreciated that although the walls 10, 13, 14 and 15 are shown in solid form in the present drawings, they are preferably hollow and open to the outside in order to facilitate manufacture by blow molding.

It will be further appreciated that in order to reach difficult spots, such as the underside of a toilet bowl rim, it is merely necessary to use the bottle in an approximately horizontal position and rotate the spray cap 9 so that the nozzle points upwardly as desired.